

DOCUMENT RESUME

ED 392 581

RC 020 466

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TITLE On Gender Targeting of Public Transfers.
INSTITUTION World Bank, Washington, D. C.
PUB DATE Nov 95
NOTE 29p.; In: van de Walle, Dominique, Ed., and Nead, Kimberly, Ed. "Public Spending and the Poor: Theory and Evidence." Baltimore, Johns Hopkins University Press, 1995. Chapter 19 (p555-581).
AVAILABLE FROM The World Bank, 1818 H St., N.W., Washington, DC 20433 (Book: ISBN-0-8018-5255-2, \$69.95).
PUB TYPE Information Analyses (070)
EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Access to Education; *Developing Nations; *Disadvantaged; Elementary Secondary Education; Females; Foreign Countries; *Public Policy; *Resource Allocation; Rural Extension; *Sex Differences; Sex Fairness; Well Being; *Womens Education

ABSTRACT

This chapter discusses the benefits and feasibility of targeting public resources and services to females. An overview of gender differences in welfare in various countries examines household expenditures, food consumption, mortality, health care, morbidity, education, and leisure, and finds few generalizations across countries. However, there is evidence of significant female disadvantage in South Asia in terms of food consumption and related health indicators, and the level of female education is significantly lower than that of men in many developing countries. Although directly increasing female income may partially offset female disadvantage, generalized gender-based transfers present problems: (1) they are very indiscriminate; (2) women may not retain control over income received; and (3) other remedies may better address the causes of female disadvantage. A more specific policy response may involve gender targeting of particular government services. Gender targeting of education has been adopted by some developing countries and is receiving favorable attention from external funding agencies. Education raises women's personal income; cannot be directly appropriated by other household members; benefits children, particularly in the area of child health; and tends to reduce fertility. Other government services that may be targeted by gender include family planning services, health and nutrition interventions, and agricultural extension services. Other types of targeted intervention may also be highly cost-effective, including reforming the content of education and strengthening female property rights. Contains 102 references. (SV)

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On Gender Targeting of Public Transfers

Simon Appleton and Paul Collier

Should public policy differentiate by gender? That is to say, should the transfers and services that the state provides to individuals vary according to the gender of the recipient? Gender targeting in favor of women can be advocated on two different grounds. A simple direct argument is that one gender, typically women, is often disadvantaged and thus on equity grounds should benefit from state assistance. A more indirect case can be built around the idea that targeting one gender, quite aside from raising the welfare of its members, is desirable because of added benefits to others.

Considering the former type of argument, even if it is established that one gender tends to be economically disadvantaged, it does not necessarily follow that gender targeting is appropriate. If disadvantage is unidimensional (say, income), if that dimension is readily observable, and if there are no problems of moral hazard, then it is more efficient to target transfers on the outcome (that is, on persons with low income) than on persons with characteristics likely to cause disadvantage (such as gender). The case for gender targeting in developing countries as a redistributive device relies on the fact that none of these three conditions is normally met. Disadvantage is more multidimensional, including poor health, reduced autonomy within the community, and reduced leisure. These are difficult to observe, to quantify, and to aggregate. Even household incomes are hard to measure because of considerable reliance on self-employment, and many developing countries have been unwilling to bear the cost of administering an efficient income tax system. Trying to assess intrahousehold income or consumption is

This chapter includes some findings from a World Bank-supported project, Women and Public Services in Africa. We wish to acknowledge the contribution of our colleagues on that project, namely David Bevan, Kase Burger, Jan Gunning, Lawrence Haddad, and John Hoddinott. We are also grateful to Kim Nead and Dominique van de Walle for helpful comments.

even more problematic. Moral hazard may be substantial and have a corrosive effect on the very principle of poverty alleviation, a principle much less firmly rooted in many low-income countries than in most high-income countries.

As a result of these difficulties, transfers made according to outcome-based criteria such as consumption or income are often likely to be infeasible. Fewer problems may be encountered by targeting on an alternative set of criteria based on the causes of disadvantage, of which gender may be a pertinent criterion. Indeed, it is quite possible that the errors made by targeting on well-observed causal characteristics, such as assets and gender, may be less substantial than the errors made by targeting on a partial and badly observed outcome.

Gender targeting is likely to be more feasible than many other forms of targeting for two reasons. First, it should be easier to identify the gender of the recipient than it is to identify other target groups. A problem with many targeting schemes is the design of delivery systems that can identify the targeted group. For example, Glewwe (1990) discusses the difficulties of targeting the poor when one cannot observe their incomes. By contrast, gender identification is straightforward. A second advantage of gender targeting over other forms of targeting is that it avoids a number of common problems of moral hazard. One difficulty with targeting is that people may change their behavior so as to fall into the targeted group. For example, they may deliberately neglect income-generating opportunities so as to obtain benefits targeted to the poor. With gender targeting, this simple form of incentive problem does not arise.

In the next section, we consider whether the premise of gender-caused disadvantage is empirically supported. The following section examines the advantages and limitations of using generalized transfers to offset any gender inequalities that may exist. We then discuss the role of in-kind gender transfers, with a particular focus on education. Finally, the chapter concludes with a few remarks on the potential for and limitations of gender targeting.

Evidence on Gender Differences in Welfare

We now survey the evidence on gender differences in welfare using a variety of quantitative indicators: estimated "equivalence scales," food consumption, mortality, health care, morbidity, education, and leisure.

Perhaps the most commonly used empirical measure of economic welfare is consumption (Glewwe 1991). However, using this as the basis for assessments of gender differences in welfare is problematic because data are lacking on the intrahousehold allocation of goods and services. In part, there is a shortage of information on personal

consumption because of the difficulties of measurement.¹ Numerous items of expenditure such as housing and consumer durables are consumed jointly by the household. Although not all household members benefit equally from such "household public goods," allocating differential benefits is problematic. Consequently, attention is usually focused on a subset of consumption goods. One approach is to focus on individual differences in the consumption of food, a private good. This approach is informationally demanding, and an alternative method is to analyze total household consumption of "child" and/or "adult" goods. In particular, if such items can be isolated, it is possible to use the outlay equivalent method to make inferences about the intrahousehold allocation of these goods. For example, if an extra girl in the household is associated with a lower fall in the consumption of adults within the household than is an extra boy, this would seem to indicate lower household allocation of resources to girls than to boys (Schultz 1989 criticizes this method for assuming the exogeneity of household demographic composition to consumption). An interesting application of this method is by Deaton (1989) using the 1985 Côte d'Ivoire Living Standards Survey. No evidence is found to suggest boy-girl discrimination.² However, among adults, there is a marked gender (and age) hierarchy. In particular, prime-age men appear to be most favored within households, followed by old men, then prime-age women, and finally old women. Such findings may be culturally specific. For example, a parallel exercise for Thailand does find evidence that boys receive more resources than girls.

The adult equivalent method is rather indirect. Moreover, because it covers only goods that can be allocated exclusively to adults or children, it may span only a small share of total expenditures. By contrast, food consumption is typically a large share of household spending in developing countries. Consequently, where the data are available, it may be preferable to rely on direct observation of individual food consumption. This is difficult because food is usually purchased collectively and cooked within a household. Indeed, many surveys identify households around such "cooking pots." Hence, data on food consumption cannot be reliably obtained by simply asking how much was spent on a particular individual's diet. Instead, one method is to ask household members to recall what they ate over a short period of time (often twenty-four hours). Alternatively, mealtimes can be directly observed, which may be intrusive and alter behavior. Evidence of gender inequalities in food consumption tends to focus on India, where there is considerable evidence that girls receive less food than boys (see Agarwal 1986; Bannerjee 1983; Bardhan 1974; Behrman 1988a, 1988b; Cassen 1978; Chen, Huq, and D'Souza 1981; Sen 1984; Sen and Sengupta 1983; Taylor, Faruque, and Kielman 1983; however, Behrman 1988b finds evidence of gender discrimination in calorie intake only

in the lean season). What is true for India may also be true for much of South Asia (see Hassan and Ahmad 1984 for Bangladesh). However, the evidence on South Asia is not uniform (for contrary findings, see Basu 1987; Behrman and Deolalikar 1990b; Das Gupta 1987; Harriss 1990, for example, argues that regional variations in gender discrimination are substantial).

Outside of South Asia, there is less evidence of gender inequalities in food consumption. For example, for the Philippines, Haddad and Kanbur (1990) find that neither sex is overrepresented among persons with inadequate calorie intake, although the extent of undernourishment tends to be slightly higher among females. Conversely, in deprived areas of the Philippines, Senauer and Garcia (1991) find that boys have a more adequate calorie intake than girls. Such studies using standard age-gender calorie requirements should be regarded with caution, since the inferences to be drawn vary considerably with other individual variables. In particular, nutritional requirements vary with a number of factors such as the degree of physical activity and whether a woman is pregnant or lactating. One example of the pitfalls is demonstrated by the work of Pitt, Rosenzweig, and Hassan (1990) on calorie consumption in Indonesia. This finds that an apparent pro-male bias in consumption is reversed when controls for energy exerted at work are included.

A related body of evidence concerns gender differences in child anthropometric status. Age-standardized measures of child weight and height partly reflect food consumption. Once more, studies outside of South Asia have tended to find little evidence that boys enjoy superior anthropometric status (see Thomas, Strauss, and Henriques 1990 and Thomas 1990 for Brazil; von Braun 1988 for rural Gambia; Deolalikar 1991 for Indonesia; Kennedy and Cogill 1987 for Kenya; Blau 1984 for Nicaragua; Senauer, Garcia, and Jacinto 1988 and Senauer and Garcia 1991 for the Philippines; Senauer, Sahn, and Alderman 1986 for Sri Lanka; Thomas 1991 for Brazil, Ghana, and the United States). Svedberg (1990, p. 482) summarizes the results of fifty studies in Sub-Saharan Africa and concludes:

The main finding is that females, whatever their age, are not at a disadvantage vis-à-vis males in anthropometric status. This may not be true in each and every part of the continent, but it is true in the great majority of the Sub-Saharan countries.

This conclusion receives some support from subsequent analyses of the Living Standards Surveys collected in the second half of the 1980s in Côte d'Ivoire and Ghana (see Haddad and Hoddinott 1994, Sahn 1990, Strauss 1990 for the Côte d'Ivoire; Alderman 1990, Thomas 1991, Haddad 1990 for Ghana). However, a potentially serious limitation to this conclusion concerns the problem of the appropriate age standard-

ization. Various researchers have found girls' anthropometric status to be significantly higher than that of boys and have questioned whether the age standardizations used are appropriate (see Appleton 1993; Thomas 1991; Senauer and Garcia 1991).³ Following World Health Organization guidelines, a reference population from the United States is conventionally used to standardize for age (WHO 1979). This is defended on the grounds that racial differences in anthropometric characteristics within affluent societies are not large. However, this view may have to be revised, given evidence such as that cited previously. For example, in a sample of final-year students in Kenyan primary schools, Appleton finds 12 percent of the boys to be stunted compared with only 2 percent of the girls and 33 percent of the boys to have low weight-for-age compared with only 9 percent of the girls.⁴ It seems implausible to attribute this effect to a pro-girl bias in food consumption; rather, it is tempting to attribute it to racial differences in the relative anthropometric characteristics of males and females.

Food consumption and anthropometric status have a special interest as welfare indicators because of their ability to predict child mortality. Gender differences in child mortality vary markedly between societies. In South Asia, female child mortality appears particularly high relative to that for males. In 1989, of those countries with populations of more than 1 million, only Bangladesh, Bhutan, India, Nepal, and Pakistan had higher rates of child mortality for girls than for boys (data from World Bank 1991). Similarly, Sen (1990) argues on the basis of cross-country variations in "sex ratios" (the proportion of women in the population) that more than 100 million women are missing. That is to say, if gender differences in mortality in Asia and North Africa mirrored those in the West, there would be 100 million more women in Asia and North Africa than presently exist.

In themselves, these figures are evidence that outcomes of interest from a welfare point of view differ markedly by gender. However, they also suggest two other points of interest. First, there is wide variation among countries. For example, much of Sub-Saharan Africa is just as impoverished as parts of South Asia but exhibits no comparable gender inequalities in mortality. This implies caution in making cross-country generalizations about the position of women. Second, gender differences in mortality rates across countries presumably reflect in large part intrahousehold inequalities in food consumption, medical care, and other "health inputs." As such, the "100 million missing women" may be only the most extreme manifestation of an underlying pattern of social disadvantage for women.

More generally, females tend to have a naturally longer life span than males (if policy is partly aimed at equalizing lifetime welfare, greater female life expectancy would provide one rationale for targeting state benefits to men). However, reproduction places gender-specific

pressures on women's health, including maternal death during labor. Developing countries may have much room for improvement in this respect, since as Schultz (1989, p. 80) notes, "Death due to bearing a child is twenty times higher in South and West Asia and North and Sub-Saharan Africa than in developed countries."

Evidence on gender differences in one important health input—food consumption—has already been discussed. Sen (1987) claims that there is more agreement that females are disadvantaged in another key health input—medical care—than there is about food. However, the relevant literature on gender differences in health care in developing countries broadly mirrors that on gender differences in food consumption. For South Asia, there is evidence that boys are more likely than girls to be sent for treatment (see Chen, Huq, and D'Souza 1981 on Bangladesh; Kynch and Sen 1983, Taylor, Faruque, and Kielman 1983, Das Gupta 1987, Miller 1981, Wyon and Gordon 1971 on India; Alderman and Gertler 1988, 1989 on Pakistan). However, elsewhere, there is little evidence that boys are favored. For example, Deolalikar (1991) finds gender differences in child health care in Indonesia to be small and, if anything, to favor girls. Analyzing rural clusters in the 1985 Living Standards Survey of Côte d'Ivoire, Gertler and van der Gaag (1990) also find insignificant gender differences in child health care. Likewise, Appleton and others (1991) uncover no significant gender differences in the proportions of persons reported sick who are sent for treatment in rural Kenya and Tanzania and in Côte d'Ivoire.

Medical care and food consumption are important in reducing morbidity as well as mortality. Morbidity data have seldom been analyzed in the economics literature, although what few studies there have been are again consistent with the pattern of results discussed above for mortality, anthropometric status, food consumption, and medical care. Using nonclinically reported data, Appleton and others (1991) find no significant gender differences in either the proportions falling ill in a specified period or in the length of illness in Côte d'Ivoire, rural Kenya, and rural Tanzania. Likewise, Deolalikar (1991) finds no evidence of higher female morbidity in Indonesia. However, the one study of morbidity in South Asia to have come to our attention—that by Chen, Huq, and D'Souza (1981) in Bangladesh—does find evidence of higher female morbidity.

Aside from consumption and health-related measures of welfare, two other individual-specific variables commonly reported in socioeconomic studies may also be important indicators of welfare. One of these is education (Birdsall 1982). Although Mincer's (1974) equilibrium theory of educational investment implies that schooling should not be associated with welfare differences, in practice there are several reasons why this may not be true. For example, schooling is commonly both subsidized and rationed by the state, while the demand for schooling

is often restricted by capital market failure and imperfect parental altruism. For these reasons, higher adult education within a household is often associated with higher household welfare.⁵ Whether the intra-household allocation of education affects the intrahousehold distribution of welfare is less well established. However, as is discussed later in the chapter, there are several *a priori* reasons for supposing this to be true. Data on educational attainment in developing countries suggest fairly widespread pro-male inequalities. Unlike much of the evidence discussed above, these inequalities are not limited to South Asia, but extend to West Asia and Africa, where women receive between half and three-quarters of the years of schooling that men receive (see Herz and others 1991, table 5). By contrast, in East Asia, Latin America, and high-income countries, there is near equality in schooling attainment between the sexes, although this was not always the case.

The final measure of welfare that can be used to provide evidence on gender inequalities is leisure. Measures of consumption—often used to proxy economic welfare—typically exclude leisure. Nonetheless, leisure may be a large component of “full income” and is claimed by Schultz (1989) to be one of the most clearly private of all goods in its benefits. In developing countries, it may be difficult to measure accurately time allocation, particularly of women. For individuals without permanent, full-time, formal employment, time allocation may vary by season and from day to day, making it hard to recall in one-shot surveys. Individuals may differ in which activities they label work and leisure: child-minding, cleaning, and cooking are not universally viewed as “work.” Furthermore, such activities may be hard to record accurately, with intermittent periods of leisure being interrupted by the demands of children or by small tasks that need completing. Nonetheless, data on time allocation, however imperfect, may be particularly revealing about gender differences in welfare. For example, surveys of rural Kenya and Tanzania reveal that women work significantly longer hours, even excluding time spent on child care: in Central Province, Kenya, females report an average of 42 percent more time spent working each year than men (Bevan, Collier, and Gunning 1989). This pattern may be true of many other countries where there is no evidence of corresponding gender inequalities in food consumption or health.

To summarize, it is difficult to make an overall assessment of gender differences in welfare. In part, this is inevitable because of the problem of generalizing across countries and because of the many imperfect measures of individual welfare. However, it also reflects a lack of research addressing the issue. Nonetheless, we offer three tentative conclusions. First, there is evidence of significant female disadvantage in South Asia in terms of food consumption and related health indicators (one must be wary of generalizing at such a high level of aggregation: Sri Lanka, although part of South Asia, appears to be a fairly

gender-equitable society). There is no widespread evidence of similar inequalities in other regions. Second, in many developing countries throughout the world, the level of female education is significantly lower than that of men. Third, it may well be that women often receive less leisure and perhaps other goods, but the existence and extent of such disadvantage have not been widely investigated.

Gender Targeting of Generalized Transfers

We have shown that gender may be a significant determinant of disadvantage. Whether it is depends both on the particular society concerned and on the welfare indicator of interest. Where there are marked gender differences in welfare, policymakers concerned with an equitable distribution would ideally seek to offset these inequalities. We have suggested that an outcome-based system of generalized transfers is unlikely to be a practical corrective to such inequalities. Would generalized transfers targeted to women be a desirable alternative? The case for such transfers is either that they benefit women or that they benefit others, such as children.

It might be thought that generalized transfers to women would necessarily raise their welfare. However, the government may have little power to prevent the appropriation of a woman's transfer by men within the household. Within a household, property rights, particularly of weaker members, may not be well defined. Indeed, to the extent that households pool resources, any benefits targeted to women may be distributed just as any other source of household income. As Schultz (1989, p. 2) notes, "Families can compensate for most government transfers, readjusting the allocation of private resources within the family until the distribution of total resources among persons again reflects the incentives and values of the family." Such readjustments may be particularly likely in those societies where women have little power; that is to say, precisely those societies where women are most disadvantaged. This objection should not, however, be overstated. Evidence suggests that most individuals keep at least some income in "purses" separate from those of other household members (Pahl 1983). Furthermore, targeted transfers may increase the intended recipient's bargaining power over pooled household income. For example, Sen (1983, 1984) suggests that an individual's independent sources of income may affect intrahousehold bargaining by enhancing their "fall-back" position, by increasing their perceived contribution to the household, by providing them with a threat in negotiations, and by affecting their sense of individuality.

Recent results of Hoddinott and Haddad (1995) and Thomas, Strauss, and Henriques (1990) are consistent with this view. Hoddinott and Haddad use household survey data for Côte d'Ivoire to attribute the

cash income of the household by gender. The proportion of household income generated by women is then used as an explanatory variable for the pattern of expenditure (controlling for possible endogeneity). They find that the higher the proportion of income generated by women, the greater is the propensity to purchase goods for which women might be expected to have a preference.⁶ This suggests both that preferences differ between the genders and that bargaining power is increased by earning power. Similarly, Thomas, Strauss, and Henriques find that, in Brazil, unearned female income has a greater effect than unearned male income on food consumption. Gender-targeted benefits might therefore enhance women's consumption indirectly, through increasing their bargaining power, despite fungibility. However, even though the fungibility of benefits may not pose an insuperable problem to targeted transfers, we argue later that in-kind transfers may be less fungible than generalized (that is, monetized) transfers.

Targeting female-headed households may partially avoid the problem of males appropriating benefits intended for females. A further attraction to such targeting is that female-headed households are often relatively poor, commonly lacking an adult male earner. However, targeting female-headed households reaches only some women. Moreover, there are clear moral hazard problems. In particular, both falsely reported and actual changes in the gender of household heads might be expected to occur in order to capture such benefits. These changes may be undesirable; for example, increased household dissolution may hinder child development.

The second argument for generalized gender-based transfers is that they may increase the welfare of others, such as children. Blumberg (1987) surveys evidence that women spend more than men on goods for household consumption, especially child goods, and less on items of personal expenditure. Such patterns may be due to what Blumberg terms "maternal altruism," the assumption that, compared with men, women tend to give higher priority to the welfare of other members of the household, particularly children. This argument again depends on women being able to retain control over income targeted to them but receives some support from the recent work by Hoddinott and Haddad (1995) and by Thomas, Strauss, and Henriques (1990). For Côte d'Ivoire, Hoddinott and Haddad discover that food expenditures rise with women's share of household income. For Brazil, Thomas, Strauss, and Henriques find that unearned female income raises food consumption, child survival, and anthropometric status by more than unearned male income.

In summary, there is some evidence that females are at a disadvantage and that increasing female income may partially offset this, as well as having added benefits. However, quantifying these effects is crucial for policy purposes. How significant is female disadvantage?

How much control would women retain over income targeted to them? How much would the added benefits be? Research on these questions is not sufficiently developed to warrant strong policy implications, and findings are likely to vary substantially across countries. However, two problems with generalized gender targeting are clear and common to most countries.

First, gender targeting of generalized transfers, like most forms of gender targeting, is very indiscriminate. The recipients include women in affluent households who are likely to enjoy higher welfare than men in impoverished households. Gender-targeted transfers thus involve a lot of type I and type II errors.⁷ This makes them a costly means of raising the welfare of the most disadvantaged. Of course, such transfers could be supplemented with transfers targeted on other observable causes of disadvantage such as low asset holdings (for example, land-owning status). This would alleviate the problem of type I errors. Furthermore, gender might be made a qualifying characteristic for transfers only in combination with these other characteristics. This would reduce the number of type II errors.

Second, generalized transfers may be a second-best remedy for female disadvantage. They may be appropriate if the sources of female disadvantage cannot be eliminated. However, the large cross-country variation in gender differences in welfare suggests that these are not inevitable consequences of human biology. Consequently, focusing on why females are disadvantaged in particular societies may suggest more fundamental policy interventions that remove the causes of such gender inequalities rather than merely offset them. This objection extends the cause-based approach by acknowledging that in itself female gender is unlikely to be the reason for female disadvantage. For example, discrimination by employers may be one reason why women receive lower earnings than men. In such a case, legislation outlawing such behavior may be appropriate. Alternatively, if child-rearing responsibilities impose a large burden on women, then state subsidies for child care might be warranted.

However, these two causes of gender inequalities, although familiar in the setting of high-income countries, may be less relevant to some low-income countries. For example, for Côte d'Ivoire, Appleton, Collier, and Horsnell (1990) find no evidence of wage discrimination against female employees or that female formal labor market participation is hindered by having children. Instead, low education is found to be responsible for much of the gender difference in both formal labor market participation and wages. In such a case, changes in educational policy may be superior to generalized transfers. Outside of formal employment, women in developing countries may also be economically disadvantaged through ill-defined and discriminatory property rights.⁸ Legal reforms to correct this situation would be preferable to palliative

transfers. Given these arguments, generalized gender targeting may be less attractive than more specific policy responses. Many of these alternatives may involve gender targeting of particular government services, and it is to these that we now turn, starting with the case of education.

Gender Targeting of Education

Gender targeting of generalized transfers is not on the agenda of policy-makers in developing countries. By contrast, gender targeting of education has been adopted by some developing countries and is receiving favorable attention in some external aid agencies (see Summers 1992; Herz and others 1991). Perhaps the most striking example is in Bangladesh, where secondary school scholarships for girls were introduced in 1977 and where secondary schooling was recently made free for girls (Herz and others 1991). Such policies are in many ways more attractive than gender targeting of generalized transfers. As with generalized transfers, they might be expected to increase welfare for women and to improve child health. Moreover, these benefits, both direct and indirect, may be larger for investments in female education than for generalized transfers. Furthermore, targeting education directly addresses one widely observed source of female disadvantage: lower educational attainment. Finally, there are several reasons why privately chosen levels of female education may be suboptimal and several arguments for intervention to induce a substitution toward it. Thus, the standard argument that generalized transfers are superior to in-kind transfers may not hold in the case of gender targeting of education.

Women might be expected to benefit from investments in their education since, as has previously been noted, education is likely to raise personal income. In developing countries, women's formal sector wages typically rise with education to the same extent as men's (see the literature surveys by Psacharopoulos 1985; Schultz 1993; for additional evidence, see Appleton, Collier, and Horsnell 1990 for Côte d'Ivoire; Appleton and others 1991 for Kenya and Tanzania; Behrman and Deolalikar 1990a for Indonesia; Birdsall and Sabot 1991, Khandker 1990 for Peru). Women's education also has significant returns in self-employment (see Moock 1976; Herz and Khandker 1991; Khandker 1990). Even where wage rate changes have no effect on women's earnings, they may increase women's intrahousehold bargaining power by strengthening their fallback position. To the extent that education does increase female earnings, one might expect women's control over this increase to be greater than their control over an equivalent gender-targeted generalized transfer.

There are other reasons why targeting education benefits to females may raise their welfare by more than an equivalent cash transfer. Unlike

cash benefits, education given to girls cannot be directly appropriated by other members of the household. Although the household may try to offset the effects of these interventions by reallocating other goods and services among its members, such compensating behavior is likely to be less complete than if the benefits are pure lump-sum transfers. For example, if a girl receives state-subsidized secondary schooling, the household has some incentive to reduce her domestic duties and to increase her consumption of some education-related goods (perhaps including food) so as to enhance her school performance. Furthermore, education is likely to raise the recipient's bargaining power within a household when she matures. Consider two of Sen's hypothesized determinants of intrahousehold bargaining power: perceived contribution to the household and own sense of autonomy. Both are likely to rise by more if a woman's income increases due to employment (made possible after education) than if she merely enjoys state handouts (these arguments also imply that state support for female training should focus on activities whereby women can earn their own cash income rather than on household activities). Education may also improve a woman's sense of self-worth regardless of whether she works outside of the household, by making her more articulate and self-confident and by exposing her to modern values that may be more gender-equitable than traditional ones.

Female education is likely to benefit other persons as well as its recipient. A substantial body of evidence exists on the effects of maternal education on child health, family size, and child cognitive development.⁹ As discussed below, these effects are often found to be greater than corresponding effects of paternal education. This may partly reflect maternal altruism and the consequences of increased female income. However, it may also reflect direct efficiency effects of education in activities for which women typically have responsibility. These direct effects may make female education more effective than generalized transfers to women.

Perhaps the most important of these effects is on child health. Evidence that female education has a greater effect than male education on child mortality is provided by cross-country studies by Cochrane, Leslie, and O'Hara (1980, 1982) and also by a time-series analysis of fifteen countries performed by Mensch, Lentzner, and Preston (1986). Some have questioned whether these effects actually represent the workings of female education or merely the operation of omitted third factors, such as parental background (Behrman 1990). However, maternal education may improve child health through a number of mechanisms. It may lead to a greater use of "health inputs" such as food, health care, and sanitation, either because of income effects or because of the effect of education on parents' knowledge, attitudes, and values. It may also increase the effectiveness with which these inputs are used

(for example, preventing the incorrect dosage of drugs). To the extent that the health benefits of parental education are informational or attitudinal, they may be larger for mothers, who commonly have responsibility for tasks related to child health, such as food preparation and taking children for medical treatment. For example, Appleton and others (1991) find that, in Côte d'Ivoire and Kenya, the probability of sending a sick child for medical treatment varies significantly with maternal education, but not with paternal education. The size of these effects is large, with simulations predicting that full maternal primary schooling would induce larger rises in the take-up of medical treatment for sick children than would the provision of a health clinic in every village. There are also direct biological links between maternal (but not paternal) health and child health during pregnancy.

Another effect of female education that may be judged important is its role in reducing fertility. Such effects have been found in a large number of countries (Demographic and Health Surveys 1990). Evidence that female education has a greater inhibiting effect on fertility than male education is provided in World Bank (1980, 1986) and Schultz (1993). This is to be expected on standard neoclassical economic theories of fertility, which assume that children are more intensive in women's time and that the value of women's time rises with their education. There may also be indirect effects on fertility because education raises women's age at marriage. This may be both because attending school is incompatible with child rearing and because, on some theories, the gains to marriage decrease with female wages (and increase with male wages). Furthermore, any effects of education on fertility via increased contraceptive efficiency may be more pronounced for women if prevalent forms of contraception rely on the woman for use. For example, Rosenzweig and Schultz (1985, 1989) find that, in the United States, the wife's education is more important in determining contraceptive effectiveness than the husband's education. The fertility-reducing effect of female education may have private benefits to the extent that it arises from greater control of fertility. It may also improve maternal and child health.

A case can therefore be made for gender targeting of education due to its positive effects on women and its added benefits to others. These effects may be greater than the corresponding benefits from generalized gender targeting, both because education may be less fungible and because education may have direct effects on fertility and child health. The added benefits in terms of such direct effects may be particularly sizable. For example, Summers (1992) argues that female education is more cost-effective than either investments in health facilities or family planning. In practice, however, some care should be taken to separate the case for targeting primary education from that for targeting secondary education. The returns may differ in the two cases: for example,

benefits for child health are more usually associated with maternal primary schooling, while, conversely, fertility reductions tend to be strongest in the case of female secondary schooling.

A simple objection to gender targeting of education is the standard argument for generalized transfers over in-kind transfers, namely that welfare will be higher if recipients are free to use transfers to consume whatever goods they like. A number of rejoinders may be made to this argument.

First, it must be set against the benefits discussed above of the reduced fungibility of education compared to general transfers. Allowing the household to allocate its resources freely may be undesirable on equity grounds if household decisionmakers are biased against females. Such bias may be extreme, with parents giving higher priority to increases in the welfare of sons than of daughters. This might be true in societies such as India, of which one official statement claims, "In a culture that idolizes sons and dreads the birth of a daughter, to be born female comes perilously close to being born less than human" (Government of India 1990, cited in Herz and others 1991, p. 31). Another form of pro-male bias might be prejudiced parental opinions of females' capabilities or restrictive views of their appropriate roles. These may limit female schooling both directly by causing parents to oppose girls' school attendance and indirectly by restricting girls' confidence, expectations, and aspirations.

Second, imperfect parental information may justify policies promoting education in general and female education in particular. Uneducated parents may be ignorant of the benefits of education. This seems particularly plausible in the case of nonmarket returns, such as improvements in child health and in fertility control. Observing the wage premium to education in the labor market is a relatively straightforward exercise, likely to be well understood by parents. However, for an uneducated parent to realize that educating his child will make her a better farmer, entrepreneur, or parent is rather more demanding, both informationally and psychologically. Such beneficial effects of education are often of a subtle form, working through increased knowledge (which the uneducated parent does not have and therefore may not fully appreciate) and through changed values. Consequently, it seems unlikely that the health benefits of maternal schooling influence the schooling decisions of uneducated parents. Indeed, until recently, standard rate-of-return calculations by labor economists assumed that there were no benefits to education beyond increased wages (Schultz 1993). Since men are more likely to obtain wage employment, corresponding parental neglect of the nonwage returns to education would lead to a markedly lower valuation of female education. For example, a study of Andhra Pradesh, India, in 1977 finds that the returns to female primary education falls from 12 percent to zero if the estimated wage

premiums are adjusted to allow for low participation in the formal labor market; for men, the corresponding fall is from 9 to 7 percent. The wage returns to secondary education exhibit a similar pattern (Tilak 1987, table 6.8).

A further reason for promoting female education is that some of its benefits may be external to those individuals (typically parents) making choices about child schooling. Parental altruism may serve to internalize much of these returns within the household. Consequently, under full information, altruistic parents might be expected to take into account the beneficial effects of schooling their daughters on the health of their future grandchildren. However some gains to female education may accrue outside the household. For example, improvements in child health may have public health benefits, while reductions in fertility reduce congestion. Increased female education may increase the status of women in society in general, rather than just that of those who are well educated. In some cases, highly educated women may act as role models and encourage others. Moreover, even when benefits are limited to household members, externalities may arise if parents are incompletely altruistic and value more highly those returns to education that they receive. In the absence of state intervention, this tends to lead to underprovision of education in general and, in some societies, of female education in particular. This is because social customs in many developing countries tend to lead to sons having closer economic links with their parents, providing more remittances and greater old age support. Particularly important are what Meillassoux (1981) terms patrilocal customs, whereby young married couples reside with the grooms' kin. Related to this is the role of inheritance customs. For example, Goody (1976) notes that Africa is characterized by homogeneous (as opposed to diverging) patterns of inheritance that favor males. Hence, parents may expect to receive more of the pecuniary benefits from child schooling in the case of sons than in the case of daughters, both because sons remain part of their household for longer and because sons can expect to be rewarded with a parental bequest.¹⁰ Consequently, imperfect parental altruism may lead to a pro-male bias in schooling.

Last, it should not be assumed that existing education levels are purely the result of parental choice. Some of the observed gender inequalities are attributable to government policies that operate to the benefit of boys. To the extent that this is true, an increase in educational investments targeted to girls may merely offset a preexisting allocation of public resources in favor of boys. This is most apparent in single-sex education systems, within which girls' schools may be underprovided. For example, Alderman and others (forthcoming, and chapter 8 of this volume) attribute most of the gender gap in educational attainment in rural Pakistan to the absence of local primary schools for girls.

However, in some countries, use of meritocratic systems for rationing state schooling unintentionally favors boys. In particular, in many developing countries, secondary schooling is subsidized by the government, and admission is granted only to students who perform well on primary leaving exams. Girls often do less well on average in these exams and thus have lower eligibility for further schooling. This rationing may account for a considerable degree of gender inequality.¹¹ Why girls tend to underperform in developing-country schools is thus an important question, but one that has received little attention from economists (for exceptions, see Alderman and others, forthcoming; Appleton 1993; Appleton and others 1991). In part, the answer may lead back to the household, with low parental demand for girls' schooling adversely affecting their performance by a variety of routes, both psychological and material.¹² However, other factors are also likely to be important.¹³

In summary, the relatively low levels of female education in much of the developing world are likely to be undesirable on both equity and efficiency grounds. The lower demand for female education may both reflect and perpetuate intrahousehold inequality. And because of parental ignorance of the wider benefits of education, the external nature of some of these benefits, and pro-male biases in some existing educational policies, these low levels of female education are unlikely to be efficient. Consequently, the fact that gender targeting of education leads to more female education than households would choose under generalized transfers may not represent the conventional welfare-reducing distortion of in-kind transfers. Instead, it may be a desirable corrective. Indeed, if, as seems likely, low education is one major proximate cause of female disadvantage, gender targeting of education is the obvious remedy.

However, gender targeting education does not avoid the type I and type II errors noted in the case of generalized transfers. Giving all girls educational subsidies would be costly, and able boys from impoverished families may be thought to be more appropriate recipients of assistance than some girls. Type II errors may be more severe as the level of education to be targeted increases. In many developing countries where there is substantial but not universal primary schooling, measures specifically designed to encourage female enrollment may mainly affect girls from poorer families. Conversely, if secondary schooling is still the preserve of the minority, then the "marginal" girls who might be induced to enroll by gender targeting may be from relatively advantaged backgrounds. As with generalized targeting, type I and type II errors imply the need to use other criteria in addition to gender when targeting. Regional criteria are one possibility, so that educational investments for females could be restricted to areas where female enrollment is particularly low.

Gender Targeting of Other Services

There may also be a case for targeting other government services by gender. For example, it may be efficient to target family planning services on women if the contraceptive technology involved depends primarily on women to implement. There may be an argument on similar grounds for targeting health and nutrition interventions on women. Leslie, Lycette, and Buvinic (1988) note that primary health care is markedly more cost-effective than curative hospital care.¹⁴ They also argue that to be effective, primary health care must be participatory and that, since women are responsible for most related activities, this means in practice that primary health care interventions depend largely on women.

Such arguments for targeting are instrumental ones, relying on the premise that women may have more responsibility for household activities of interest. A different case for targeting services would be to try to ensure that females receive a larger share of the benefits of these interventions (these two forms of targeting may conflict: making women informal "health workers" may actually enhance gender inequalities by increasing the obligations on women's time). One perhaps accepted form of this is programs focused on maternal health. In addition, targeting more general health services to women may be attractive in those areas where, as discussed above, there are marked gender inequalities in nutrition, health care, and health outcomes. Indeed, household investments in the health of girls may be inefficiently low for reasons similar to those given for why too little female schooling is demanded.¹⁵ However, directly redressing these inequalities may lead to some of the practical problems noted with general transfers. Directly altering the intrahousehold allocation of food is likely to be more difficult than directly affecting the intrahousehold allocation of schooling. For example, many researchers (including Chernichovsky and Zangwill 1988) note that, with school feeding programs, families reduce the amount of food they allocate to children who are provided with school meals. Countering low take-up of medical services for females may be more feasible, using measures similar to those mentioned for increasing female school attainment. Moreover, as with schooling, general measures to increase take-up may be particularly effective with girls. For example, Alderman and Gertler (1989) find that the demand for health care in Pakistan is more price elastic for girls than for boys.

Gender targeting may be appropriate in some government services outside the social sector. One important case may be agricultural extension services. Poor female access to these services has been widely noted (see Baxter 1986; Saito and Spurling 1991; Saito and Weidemann 1990). Sometimes this gender bias is intentional, with the assumption

being that men make agricultural decisions and pass on whatever information is necessary to their wives. However, the biases may exist for other reasons. Extension agents tend to be men and usually prefer to talk to men, even where women are farmers or even heads of household. More generally, as Schultz (1989, p. 84) states, "Priority is often given to supporting cash crops, which are often managed by males, because of the commercial and governmental interests in these potential export crops that provide tax revenue."

These biases may have equity and efficiency costs, particularly in economies (such as many in Sub-Saharan Africa) where women run "own-account farms" distinct from the household farms managed by men. Work by Spring, Smith, and Kayuni (1983) in Malawi is suggestive. Female-headed households and wives are found to receive fewer extension visits than men, but women attribute more of the agricultural innovations they make to extension services. More recently, Bindlish and Evenson (1993) find in Kenya that female frontline extension workers have a powerful additional impact on the productivity of farms run by female household heads.

Recent work on agricultural innovation in Kenya has found that information variables are important and that there are substantial gender differences in information channels. Investigating the adoption of coffee, Burger, Collier, and Gunning (1993) find a powerful copying effect: households imitate the decisions of their neighbors. This by itself is not surprising, being entirely consistent with welfare maximization once it is recognized that information is costly. However, this pattern of imitation is found to be gender-specific: male decisionmakers copy only other male decisionmakers, female decisionmakers copy only other female decisionmakers. Again, there is nothing particularly puzzling about such behavior. If the function of copying the decisions of others is to free ride on their investments in information, it is advisable to copy persons whose characteristics appear to be as similar as possible to one's own. Evidently, gender is seen to be a pertinent characteristic, indicating that female decisionmakers are perceived to face distinctive constraints. This is indeed consistent with the result that the gender of the decisionmaker is the most powerful and significant of all the explanatory variables in coffee adoption. Female decisionmakers are markedly less likely to innovate, even controlling for access to information and endowments of land and labor.

The gender specificity of copying is of importance for public policy because the current endowment of role models is so different for the two genders. Male-headed households have plenty of innovators from whom to copy, female-headed households have few. The public information channels of extension and education need, therefore, to be gender targeted so as to offset a bias in private externalities. In the case of Kenyan coffee adoption, education of the decisionmaker is

found to be significant in inducing innovation only for females. Education appears to be functioning as a substitute for the dearth of female role models.

There may be similar arguments for gender targeting in other areas of policy. For example, female farmers are often disadvantaged in access to credit, because inheritance practices and control of property within marriage inhibit their ability to own land (Davison 1988; Moock 1986).

Conclusions

Gender appears to be one of the dimensions of disadvantage. In developing countries, there are large gender differences in the choice of economic activity. For a variety of reasons, a consequence of these choices is that in the aggregate, women have fewer role models among the economically successful. If role models play an important part in determining activity choice, this tends to perpetuate the concentration of women in less productive activities. Education is both an example of this difference in activity choice and potentially a mechanism for offsetting it. At present, girls are less likely to be sent to school, are more likely to drop out, and tend to perform less well in examinations (contrary to their peers in high-income countries). Arguably, part of the reason for this is that parents are less aware of, or stand to benefit less from, the returns to educating a daughter than the returns to educating a son. Parents may be less able to capture the monetized returns to the education of daughters, and they may not recognize the nonpecuniary private benefits, such as the improved health of their grandchildren. Finally, they do not take into account any externalities that arise if the education of women substitutes for a dearth of role models as agricultural innovators or wage earners.

Although we have emphasized educational targeting as preferable to generalized transfers, other types of targeted intervention may also be highly cost-effective. There may be a role for the government in reforming the content of education as well as the composition of its recipients.¹⁶ Legal reforms to strengthen female property rights may also be important in attaining both gender equity and efficiency.

Finally, we should stress a major limitation with gender targeting: in targeting half the population, it is very indiscriminate. There are also often large differentials in the takeup of specific services, with more advantaged individuals tending to take a larger share. For example, Vaughan (1987) suggests that women who take up government interventions are likely to be richer (and older) than those who do not. This suggests that even for in-kind transfers, gender is more appropriately used only in conjunction with other criteria.

Notes

1. One method of trying to circumvent the difficulties in observing personal consumption is to use personal income as a measure of welfare. Attributing the source of income to particular household members is often easier than determining the intrahousehold allocation of consumption. However, this is unlikely to be a preferable approach if the household performs a significant redistributive function. In particular, one would want to take into account intrahousehold transfers of income, and this often entails the same exercise as identifying the pattern of intrahousehold consumption, since such transfers are often in kind.

2. These results have been corroborated using the 1986 Côte d'Ivoire Living Standards Survey by Haddad and Hoddinott (1994). However, disaggregation by age and relation to the household head does suggest some pro-male bias in resources allocated to young (under seven years) nonoffspring of the household head.

3. Similarly, Sahn (1990) finds that height-for-age is significantly lower for boys than for girls in urban Côte d'Ivoire, as do Senauer and Garcia (1991) for the Philippines. Von Braun (1988) also reports higher anthropometric status for girls than for boys in rural Gambia.

4. Stunting is defined as having a height-for-age more than two standard deviations below the U.S. median. Similarly, a "low" weight is defined as a weight-for-age more than two standard deviations below the U.S. median.

5. This generalization may not always be valid: access to off-farm employment and other factors may affect the returns to education. For example, Glewwe (1991) finds that adult education is associated with higher consumption per capita in urban but not rural Côte d'Ivoire, while Appleton (1992, app. 1) finds that adult education increases household income per capita in rural Kenya, but not in rural Tanzania.

6. The results imply that doubling women's share of household income would reduce the share of alcohol and tobacco in total expenditures by 25 and 15 percent, respectively. The increase in the food share would be more modest, at 2 percent. However, the authors argue that even the effect on food spending is substantial. As an illustration, they calculate that the fall in gross domestic product in Côte d'Ivoire in the 1980s (averaging 0.6 percent per year) would not have reduced food spending if all incomes had been redistributed to women.

7. In the terminology of statistics, type I errors are rejecting something that is true, and type II errors are accepting something that is false. Thus in this context, type I errors would be denying services or transfers to men who are poor, while type II errors would be giving assistance to women who are not poor.

8. Particularly important are women's rights to property within and after marriage. One example of the former is in Zaire, where the Civil Code presumes that the wife's goods are managed by her husband, with the consequence that there is a substantial black economy of female traders (MacGaffey 1986). An instance of the latter again occurs in Africa, where women often have only usufructuary land rights, so that, after divorce or bereavement, they can no longer work family land unless supported by male relatives of the husband (Bryceson 1985).

9. Evidence for the last of these three effects is less well documented by economists. Lavy (1992) finds that maternal education in Ghana leads to greater child schooling than paternal education. However, Appleton and others (1991) find no similar pattern in Côte d'Ivoire, rural Kenya, or rural Tanzania.

10. Hoddinott (1994) finds a positive relationship between land and remittances in rural Kenya. He interprets this as the promise of a bequest of land acting as a lever by which parents may obtain transfers from their children. A logical extension of this argument is that if parents are more confident of securing remittances, they may be willing to invest more in their children's education. This extension is as yet unsubstantiated by empirical evidence.

11. For example, in Côte d'Ivoire in 1986, this state rationing, rather than low demand, was the proximate cause of lower female continuation rates from primary to secondary school. In Kenya in the mid-1980s, continuation rates were roughly equal between genders, but poorer performance by girls in the primary leaving exam led to girls being skewed into what is perceived as the lower-quality private sector (Appleton and others 1991).

12. One example of this is provided by the analysis of Appleton and others (1991) for Côte d'Ivoire. There, according to the 1986 Living Standards Survey, gender differences in performance in the primary leaving exam diminish with household consumption. This may be because poor households use girls' labor at the expense of their studies. Support is found for this in the fact that, among the poorest quartile of students, girls in the final year of school spend an average of eight hours a week less than boys in school. This pattern is not observed in other quartiles. Furthermore, multivariate analysis reveals that hours in school are significantly positively correlated with subsequent exam performance.

13. Grisay (1984) provides an interesting discussion of Côte d'Ivoire. Among the hypotheses she suggests for the inferior performance of girls in primary school are the inhibiting effect on classroom participation of cultural values, a shortage of female teachers, the use of French as a medium of instruction, and the younger ages of girls on enrollment into school.

14. They define primary health care as having eight components: (1) health education, (2) nutrition and food (purchase and preparation), (3) maternal and child health care (including family planning), (4) water and sanitation, (5) immunization, (6) disease control and prevention, (7) essential drugs, and (8) treatment of common diseases and injuries.

15. See also Rosenzweig and Schultz (1982) and Bardhan (1982, 1984), who attribute gender differences in child mortality in India to differential returns to male and female labor. Such explanations are challenged, however, by Das Gupta (1987) and Folbre (1984).

16. One relevant example of the former concerns the role of women as presented in school. For example, in school textbooks in Zambia, women rarely appeared and, when they did, were "primarily in domestic roles and were characterized as passive, stupid, and ignorant" (Tembo 1984, quoted in Hyde 1989, p. 34). Efforts to remove sexual stereotyping from textbooks have taken place or are under way in Bangladesh, Costa Rica, the Gambia, Guatemala, Mexico, and Zimbabwe (Herz and others 1991).

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